Cost Evaluation of Evidence-Based Treatments

Many treatment programs have adopted or are considering adopting evidence-based treatments (EBTs). When a program evaluates whether to adopt a new intervention, it must consider program objectives, operational goals, and costs. This article examines cost concepts, cost estimation, and use of cost information to make the final decision on whether to adopt an EBT. Cost categories, including variable and fixed, accounting and opportunity, and costs borne by patients and others, are defined and illustrated using the example of expenditures for contingency management. Ultimately, cost is one consideration in the overall determination of whether implementing an EBT is the best use of a program's resources.

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Substance abuse treatment programs continually pursue the operational goals of providing effective treatments to clients and maintaining a stable business. Many programs have adopted or are considering evidence-based treatments (EBTs) as a way to advance both objectives. These are interventions that have demonstrated their ability to enhance patient retention, abstinence, and/or other desirable outcomes when compared with clinics' established treatments. Programs that adopt EBTs may improve revenue flows by attracting new clients and by drawing referrals and funding from sources that require the use of interventions with proven efficacy.

This article aims to help programs considering whether to adopt an EBT. We briefly discuss criteria for identifying suitable EBTs and then focus primarily on costs: basic cost concepts, cost estimation, and the use of cost information in the final adoption decision. Ultimately, a program's assessment of its organizational goals and traits, together with an analysis of costs, prepares it to determine whether implementing an EBT will produce adequate value. We illustrate concepts using the example of contingency management (CM), an EBT that has been shown to enhance outcomes in a variety of treatment settings.

FIRST STEPS: DEFINING GOALS, IDENTIFYING CONSTRAINTS

Programs have many EBTs to choose from, both psychotherapeutic (e.g., motivational interviewing [MI], cognitive-behavioral therapies [CBTs], CM, and family-based models such as multisystemic therapy) and pharmacological (e.g., buprenorphine/naloxone, naltrexone, disulfiram, acamprosate, and medications for co-occurring medical or psychiatric disorders). For a comprehensive list, see *www.nrepp.samhsa.gov.*

Not all EBTs are equally suitable for every program. Before focusing on any specific EBT, a program should clarify what it hopes to accomplish by implementing a new intervention. One primary goal will almost always be to provide more effective treatment; another is likely to be to ensure financial stability or make a profit; and a third might be to attract more clients from new demographic groups, users of other types of drugs, or individuals referred from new sources (e.g., criminal justice, child protection, or employee assistance systems). Programs may implement EBTs to attract, develop, and retain staff members who are highly skilled, knowledgeable about advances in the field, and engaged in quality improvement. A program may see EBT adoption as an effective strategy to improve its ability to compete successfully with other programs and maintain a reputation as an innovative and effective provider of addiction treatment. Clinics that receive public funding, and hence have a responsibility to society at large, may utilize EBTs to improve secondary outcomes of drug abuse treatment such as reducing the spread of disease (tuberculosis, HIV/AIDS), crime, and unemployment.

Whatever the reasons for a program's interest in EBTs, its client, organizational, and funder characteristics delimit the set of potentially suitable interventions (see Table 1). In general, a clinic will want to consider only EBTs that have demonstrated efficacy, in several studies, among patients who are similar to those it intends to treat—for example, in terms of primary drugs of abuse, age (e.g., adolescent or adult), gender, co-occurring disorders, and other problems (Harwood and Myers, 2004). Before moving ahead with an EBT, a program should be confident that clinic staff either possess the skills to administer the intervention effectively or can be trained to do so. Otherwise, inadequate skill levels or negative attitudes may hinder or preclude effective delivery, no matter how well the intervention performed in controlled clinical trials. For example, a program whose staff objects to paying patients for abstinence may not attain the same outcomes from CM as one whose staff accepts the intervention's underlying rationale of tangible positive reinforcement for achieving treatment goals. Similarly, with regard to funders, a model that provides incentives, or one that emphasizes harm reduction and client choice rather than abstinence and treatment compliance, might not obtain buy-in from the criminal justice or child protection systems.

Once a program has defined its goals and constraints, it can match them to available EBTs by consulting a growing reservoir of published materials. These include EBT psychotherapy manuals, pharmacotherapy protocols, computer programs, and other guidelines that have been made available by the National Institute on Drug Abuse (NIDA), the Center for Substance Abuse Treatment (CSAT), the Substance Abuse and Mental Health Services Administration (SAMHSA), and other sources (see Resources for EBT Decisionmaking on page 48).

TABLE 1. Questions to Ask Prior to Adopting an EBT

- What evidence-based treatments (EBTs) are available? Which would be most suitable, be most likely to be effective, and give the greatest value to the clinic?
- How strong and generalizable are the effectiveness findings? Do the findings apply to the clinic characteristics and clinic's clients (e.g., primary drug use, women, adolescents, criminal justice clients)?
- Does the treatment improve the outcomes that the clinic, client, and staff care most about (e.g., abstinence, reduced drug use, reduced crime, better family functioning, increased employment, harm reduction)?
- Is the EBT a good match to the clinic in terms of staff, clients, payers, etc.?
- Will adopting one treatment prevent, or facilitate, the adoption of others now or later?
- Will clients and those referring clients (e.g., criminal justice system) be interested in and satisfied with this treatment?
- What, if any, will be the extra costs of adoption, staff training, new staff, management time, etc.?
- Will payers be willing to pay for any extra costs? Which payers and how much?
- Will staff be eager to adopt? Will adopting the EBT affect staff morale? Will it affect satisfaction and turnover? Is there a staff champion of the EBT?
- How difficult and expensive will it be to provide high-quality, effective care (e.g., fidelity to psychotherapies)?
- How available, user-friendly, and costly are the methods available to learn and adopt the new EBT and/or obtain technical assistance?
- Should the EBT be phased in slowly or fully adopted immediately?
- Can the adoption decision be reversed without large costs to the clinic if it proves to be a poor decision?
- Should all the patients get this treatment?
- What are the benefits to adopting? The costs? Do the incremental costs outweigh the benefits gained?
- To what extent does the clinic want to follow up and evaluate costs and profits as well as staff satisfaction?

COST AND VALUE

Before committing to an EBT, a program should answer three key questions regarding costs:

- What will be the fixed and variable costs of implementing and maintaining the EBT?
- Will the intervention increase, decrease, or have no impact upon the financial bottom line?
- Will the intervention be the best use of the resources that it will require?

The first and second questions are strictly financial: their answers indicate whether the program will have sufficient resources to implement and maintain the new intervention and the potential impact on profitability. The third question is about value. To answer it, the program must weigh all the advantages expected from the EBT—e.g., monetary benefits, improved client outcomes, public health improvements—against what might be obtained by dedicating the same amount of resources to the next best available use (see Table 2). Whatever the outcome of the cost inquiries, adoption of the EBT is only suitable if the answer to the value question is affirmative.

COST CATEGORIES

EBTs vary widely in what they require in terms of training, equipment, counselor time, and other inputs and in the cost of the inputs. For example, pharmacotherapies involve outlays for medication, associated tests, physician and nursing time, storage, and inventory control; psychosocial treatments entail expenditures for initial training as well as ongoing supervision and retraining. Costs may also vary with the scale of operation, the type of clinic, and even the geographic location. The impact of each specific cost on the desirability of implementing an EBT depends upon whether it is (1) variable or fixed, (2) accounting or opportunity, (3) paid by the clinic, patients, and payers, or society at large.

The opportunity cost of adoption of one EBT may be that another one cannot be adopted.

Variable and Fixed Costs

Most EBT costs are variable. This category includes any expenditure that is tied directly to the number of patients or service units provided. Counselor time and medications are core variable costs. Depending on the specific procedures used, a program's outlays for training activities and clinical supervision to maintain fidelity to an EBT may also count as variable costs.

A program can tally variable costs to predict the cost consequences of a new policy, such as increasing its census or implementing an EBT. For example, suppose a program contemplates expanding the number of patient slots for buprenorphine maintenance therapy. As long as the cost of buprenorphine remains unchanged, the program can project additional variable costs based on the number of new patients and the average cost of the medication per current patient. However, suppose a program adopts an EBT that requires patients to attend more frequent counseling sessions than the program's prior standard. In this case, the program's new outlays for counseling time will reflect both the number of new patients and a higher per-patient outlay for counseling time.

The fixed costs of a treatment include overhead such as rent, mortgage, insurance, and other contracts and expenses that remain stable over a long period of time, typically a year or more. As an illustration, a program that to date has provided only psychosocial services but now plans to implement a pharmaceutical EBT will anticipate new variable costs (cost of the medication), and also new fixed costs to maintain a pharmacy—e.g., rent (if a new space is needed), upkeep, and costs related to stocking the medication and fulfilling regulatory requirements. As another example, a program that adds prize-based CM to its service offerings will project new variable expenditures for prizes and new fixed costs to acquire and store prizes and manage the prize system.

A program may consider a new EBT a financial success if it produces sufficient income simply to allay its own variable or total costs, or the program may require that the intervention help allay preexisting overhead as well. As with variable costs, there is an interplay between the fixed and per-patient costs of an EBT. For example, if the rental cost for pharmacy space is the same whether 20 or 100 patients receive medications, the per-patient cost will be smaller if 100 patients are served. Because of this interplay, an EBT may be fiscally unfeasible at a small scale yet profitable at a larger scale.

Accounting and Opportunity Costs

Variable and fixed EBT-related outlays are often also opportunity costs, defined as disbursements that might alternatively be used for other ends. For example, an EBT-related outlay that is paid from a program's operating surplus represents an opportunity cost, since the program has the option to use that money to pursue its aims in any way it chooses—such as to expand its present services or lower patient fees. In contrast, an EBT-related outlay that is paid entirely from a grant that is made specifically to support that particular intervention is not an opportunity cost, because the program must either use that money for the EBT or return it to the granting agency. The opportunity cost of adopting one

EBT may be that another one cannot be adopted. The concept of opportunity costs reflects the reality that most clinics have limited monetary and other resources, and implementing a new EBT usually means forgoing other opportunities. Opportunity costs indicate the real value of resources and should be used in cost and cost-benefit considerations.

Costs to Patients and Others

Programs, especially public programs, must also consider EBT-related costs that will be borne by their patients, patients' families, and communities. For patients, these costs typically can include fuel or fares for transportation to clinic visits, costs for child care, and time that is spent in the clinic but might otherwise be used to earn wages or for other positive activities. A patient's family may have parallel expenditures if members accompany the patient to the clinic, participate in family therapy, or provide other support, such as child care.

An EBT that imposes unacceptably high costs upon patients or other stakeholders may attract fewer clients or experience lower adherence to treatment. For example, an intervention that requires fewer clinic visits may appeal to patients more than one that requires more clinic visits, even though the latter might yield superior benefits for those who stick with it.

Additional Costs

Along with the costs to deliver a particular EBT, clinics may incur indirect costs as a result of changes related incidentally to implementing the intervention. For example, if patients increase adherence and attend the clinic longer with the new EBT, they will generate more treatment costs. In such a case, the additional treatment costs might or might not be offset by the increased revenue from the patients' additional clinic sessions.

PUTTING NUMBERS TO CONCEPTS: COSTING OUT CM

CM is a robust psychosocial EBT that has improved outcomes in clinical trials with abusers of a wide range of substances in a variety of treatment settings. At the core of CM is the use of tangible rewards to reinforce abstinence, attendance, and/or the achievement of prosocial or recovery-oriented goals. Patients typically earn cash, a prize, or a voucher for goods or services each time they present objective evidence of commitment or progress in treatment. CM interventions most commonly reward drug-free urine or breathalyzer tests, and some give prizes for attendance and participation in counseling sessions. CM has been shown to improve abstinence, length of stay in treatment, clinic attendance, and medication compliance (Lussier et al., 2006).

Early CM incentive programs were relatively expensive, but more recent CM designs have reduced costs while maintaining effectiveness. The three most significant CM outlays, discussed below, are the reward payments to patients, drug test kits, and labor to administer the incentive intervention. Each rises and falls in close correlation with the number of patients and so is a variable cost. Fixed costs of CM include establishing a reward and tracking system. An indirect effect may be that patients in CM stay longer; this could result in greater costs as well as greater reimbursement.

The importance of CM rewards declines as patients become motivated by improvements in their quality of life.

Reward Payments

The cost of reward payments in CM depends on the structure and generosity of the prize schedule, the clientele and their successes, the frequency of testing, and the effectiveness of the underlying usual care. The first tested version of CM gave cash rewards that totaled as much as $1,000 to each patient who remained abstinent throughout a 12-week treatment period (Higgins et al., 2000). Subsequent CM models have reduced costs by using a lottery system to award prizes (so that only a portion of patients meeting reward criteria receive rewards with monetary value), de-escalating payments in the later stages of treatment, and/or using nonmonetary rewards such as the right to take home medications. Petry and colleagues (2004) developed an incentive program in which patients who provide drug-free tests earn the right to draw for a set of prizes; the number of draws increases as the number of days of continuous abstinence increases. In a clinical trial, this design improved abstinence with total average payouts ranging from $36 to $68 (Petry et al., 2004).

Test Kits

CM protocols test frequently for drug use to provide patients with ample opportunities to earn the rewards that enhance motivation for abstinence. The frequency of testing in CM is more than that of most standard care protocols, and the added tests constitute a substantial variable cost of the EBT. For example, if a CM protocol schedules patients for two additional tests per week, and patients attend all their appointments, the clinic may incur costs of $8.40 per patient per week ($4.20 per urinalysis test cup). In a more realistic sce-

nario, patients may keep only 50 to 75 percent of their appointments and the incremental costs for CM test cups decline accordingly. The labor cost for administering each urine test has been estimated to average less than $2.50. To reduce these costs, some clinics have tried reducing the number of drug tests later in treatment, on the supposition that the importance of the CM rewards declines as patients achieve sufficient recovery to become motivated by improvements in their quality of life. Note that these cost estimates will, of course, vary over time and across geographic areas.

RESOURCES FOR EBT DECISIONMAKING

The Substance Abuse and Mental Health Services Administration (SAMHSA) National Registry of Evidence-based Programs and Practices (NREPP; *www.nrepp.samhsa.gov*) provides definitions of EBTs and a rating and classification system of the scientific evidence for a range of substance abuse and mental health treatments. Descriptions of intervention implementation and fidelity measurement are intended to help determine the practicality of adopting specific treatments in practice settings.

Although intended for use by applicants for grants through SAMHSA's Center for Substance Abuse Treatment (CSAT), the *Inventory of Effective Substance Abuse Treatment Practices* provides a list of publications that may be useful for those considering adoption of EBTs. The Web sites (*csat.samhsa.gov/treatment.aspx* and *ncadi.samhsa.gov*) provide access to descriptions of multiple substance-related interventions, including implementation, staffing, and fidelity measurement issues.

SAMHSA has supported the development of numerous resources to facilitate technology transfer, including the implementation of EBTs. Its Addiction Technology Transfer Centers *(www.attcnetwork.org)* created a very useful resource for community programs considering adoption of an EBT. *The Change Book: A Blueprint for Technology Transfer*, 2nd Edition (2004), and companion workbook are free downloadable guides *(www.nattc.org/resPubs/changeBook.html)* to the steps involved in putting research-based interventions into practice. The Iowa Consortium for Substance Abuse Research and Evaluation developed *Evidence-Based Practices: An Implementation Guide for Community-Based Substance Abuse Treatment* (2003), which provides EBT definitions, literature reviews, adoption and implementation challenges and barriers, assessments of readiness to change, and evaluation guidelines *(www.uiowa.edu/~iowapic/files/EBP%20Guide%20-%20Revised%205-03.pdf)*.

The National Implementation Resource Network (NIRN) operated at the University of North Carolina, Chapel Hill, provides a wide array of resources related to best practices and the integration of science and service within several areas of behavioral health. The NIRN Web site *(www.fpg.unc.edu/~nirn/)* provides information on training institutes, conferences, other Web sites focused on dissemination, implementation research, and technical assistance as well as access to relevant articles, reports, and newsletters related to the stages and processes of implementation. In collaboration with NIDA and CSAT, the Institute for Research, Education and Training in Addictions (IRETA; *www.ireta.org/ireta_main/nida_initiative.htm*) provides a range of resources related to the implementation of best practices. The Web site contains or provides links to information on intervention implementation, technical assistance, fidelity measurement, staff training, and other EBT references.

Labor Costs of Operating the Reward System

The labor cost to operate a CM reward system will depend on the simplicity or complexity of the specific protocol, the efficiency with which it is implemented and run, and the wage rate of the personnel involved. In surveys of clinics in 2002, the total labor cost, including shopping for prizes, was estimated to be about $11 per client per week. However, clinics should be able to provide CM less expensively than this because: (1) the surveyed clinics employed trained counselors (at about $20 to $22 per hour, including fringe benefits) rather than technicians to administer the intervention, and (2) for purposes of the trial, the clinics did not implement CM on an efficient scale.

Note that CM labor costs do not include outlays to counselors for administering the standard counseling, even though CM patients also receive such counseling. This is because CM is implemented as a discrete supplement to standard therapy.

TALLYING AND TOTALING COSTS

The most appropriate method for estimating the complete costs of an EBT is usually to itemize and price all service units that are allocated to the intervention. Service units are the specific inputs utilized in the intervention, such as an hour of counselors' time, a dose of medication, a drug test kit, recordkeeping, and use of facilities and equipment. The quantity of each unit will be estimated prior to implementation of the EBT, and then tracked following implementation.

The advantage of the service unit approach is that it isolates the incremental costs of an EBT—that is, the extra expenses that the intervention adds to overall operating costs. In a demonstration of this approach, Anderson and colleagues (1998) asked program personnel to keep a diary for 1 week and record each time they provided any of 94 different service inputs. The researchers used the diaries on unit use plus information on the unit price for each input—for example, the number of counselor hours and the counselor's hourly wage rate, the price of a drug test kit and the number of kits used, use of clinic space and fair market real estate values—to calculate the total expenditures related to each

TABLE 2. Common Costs and Benefits of Introducing New EBTs

PERSPECTIVE	POTENTIAL COSTS	POTENTIAL BENEFITS
Clinic	Staff • Training and retraining • Ongoing supervision to ensure fidelity • Time providing treatment • Administration such as treatment notes Management • Startup and ongoing oversight Medications Other Resources • Space, tests, materials, technical assistance, medical services, etc. Longer length of stay due to satisfaction	• More effective treatments • More satisfied clients • Reputation for cutting-edge, quality care • Ability to attract new clients, new and more referrals • Greater revenue • More satisfied staff, lower turnover, easier to attract staff
Patients and Their Families	Extra time and travel for additional visits, additional tests, etc.	• More effective and durable treatment, resulting in – Better mental and physical health – Greater employment and income – Greater family functioning – Reduced expenditures for drugs – Fewer legal problems
Payers and Society	Higher outlays for treatment	• Reduced crime and fear of crime • Reduced spread of HIV/AIDS, STDs, hepatitis C, and other contagious diseases

treatment episode. Yates (1999) provides a step-by-step description of the use of daily time sheets to estimate service unit costs.

A few published studies have estimated the costs of particular EBTs. Programs may use these as benchmarks in EBT decisionmaking, but with the caveat that protocol, organizational, and contextual differences may result in significant cost variance from program to program.

Jones and colleagues (2009) examined the costs of providing buprenorphine for opioid dependence. The study compared the costs of clinic-based methadone (MC), office-based methadone (MO), and office-based buprenorphine (BO). Treatment costs were calculated over 6 months of maintenance for patients who had previously been stabilized for at least 1 year. The total monthly cost of treatment per patient was estimated to be $147 (MC), $220 (MO), and $336 (BO). Much of the cost advantage of methadone was due to its lower price, which was $93 (MC) or $86 (MO) per month, compared with $257 for buprenorphine. The patients' treatment-related costs (e.g., time taken to attend clinic, transportation costs, babysitting costs, etc.) were $92 (MC), $63 (MO), and $38 (BO).

NIDA's Clinical Trials Network analyzed the effectiveness and cost-effectiveness of prize-based CM in a set of large, multisite trials. In one study, patients remained in treatment longer and achieved longer periods of abstinence after CM was added to the psychosocial services offered by eight outpatient programs (Olmstead, Sindelar, and Petry, 2007a). The incremental cost for CM was estimated to be $448 (range $306 to $582) per treatment episode, with an average patient stay of slightly more than 8 weeks. Of this amount, $213 was for prize payments, $146 for operating the prize system, $50 for testing costs, and $39 for extra counseling costs incurred due to clients' longer stays in treatment. In a second study, the incremental cost to add CM to methadone maintenance was $225 overall, of which $130 was dispensed as prizes (Sindelar, Olmstead, and Peirce, 2007). Comparison of the results of the two studies suggested that adding CM to methadone maintenance was more cost-effective than adding the EBT to the psychosocial

programs. The likely reason was that the patients in the psychosocial programs tended to do fairly well without the addition of the EBT.

Zarkin and colleagues used their Substance Abuse Services Cost Analysis Program (SASCAP) to estimate the costs of providing methadone (Zarkin, Dunlap, and Homsi, 2004). In a sample of 70 programs, they estimated the annual per patient cost to be $4,176, including initial assessment, group counseling, medication purchase and dispensing, and other cost components. They indicated that other similar estimates ranged from $2,800 to $6,300 (in 2000 dollars) (Zarkin, Dunlap, and Homsi, 2004). Roebuck and colleagues (2003), using data from a large number of studies fielded over 10 years, estimated that the mean cost per patient for methadone maintenance was $91 per week, or $7,358 per treatment episode. The Drug Abuse Treatment Cost Analysis Program instrument that was used to make this estimate is available online *(datcap.com)*.

Perhaps over time NIDA, CSAT, or other professional groups could develop a set of template cost calculations, cost-effectiveness studies, or cost-benefit studies that would guide clinics in EBT adoption decisions. The information would be most useful with adjustment factors to reflect variable clinic characteristics: for example, type (e.g., residential, outpatient, methadone maintenance), client population (e.g., mixed gender or women only, primary drugs of abuse), funding sources, and geographic area. Such efforts would simplify EBT decisionmaking and by doing so encourage more widespread adoption of EBTs.

TO ADOPT OR NOT?

Substance abuse treatment programs should consider implementing EBTs, which have demonstrated their ability to improve client outcomes and potential to support other strategic and financial objectives. By consulting the literature, most programs will be able to identify a selection of EBTs that are well suited to their goals, organizational traits and strengths, and client and funder needs and expectations. Cost estimation and analysis provide critical information toward the question that ultimately should determine the course of action: Among all the options we have for using our resources, is this the one that will do the most to advance the totality of our organizational objectives?

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RESPONSE: THOUGHTFULNESS REQUIRED

Greg Brigham, Ph.D.; Ron Jackson, M.S.W.; and Janet Wood, M.B.A., M.Ed.

Janet Wood: I found the article timely. In Colorado, we are trying to institute unit costing statewide to get folks to be able to define what it is they do, pair costs and outcomes, and paint a better picture of what they're delivering. Some organizations are very skilled in this, but not all.

Greg Brigham: I enjoyed the article. I think that, in general, people don't focus enough on how to decide when to implement an evidence-based practice. I especially appreciated the authors' table of questions to ask prior to adopting an intervention. They are good questions, and they exemplify the sort of thoughtfulness that's required to make good decisions.

Ron Jackson: They're the meat of the article.

Interventions small and large

Brigham: The authors' choice of contingency management (CM) as a main example to illustrate cost concepts is a good one, in the sense that its elements are relatively tangible and easily counted, almost like a medication. You can just tally up the costs of the gifts and the costs of administering the program, and that's basically what the intervention is going to cost.

Jackson: Another advantage of CM is that it's relatively easy to monitor fidelity. Did you follow the reinforcement schedule or not? Did people get their reinforcers in a timely fashion? Yes or no?

Brigham: Cost assessment can be considerably more challenging, however, for some other evidence-based practices. For example, motivational interviewing (MI), which is very popular, requires more training and supervision than CM. Fidelity evaluation for MI is more complex than simply counting the number of gifts being given out. Cognitive-behavioral therapy is another intervention that's more complex than CM; it takes more training and supervision and may require special staff.

Jackson: That's right. Suppose you want to implement MI and integrate it routinely into your treatment program. You'll use the basic principles described in the article to make your cost estimate, but it'll be difficult to estimate how much training it's going to take and how much additional supervision is needed to monitor and maintain fidelity.

Wood: CM is also simple to cost out compared with many other practices, because you usually add it to your treatment as usual instead of using it to replace something else you do. For the same reason, the cost-benefit question—how much improvement am I getting for my investment?—is often easier to answer with CM.

Brigham: Yes, programs will find it difficult to separate out the impact of some of the bigger, more involved evidence-based interventions from the effects of all of the associated inputs and changes. For those interventions, in general, I think programs have to rely on the research findings for estimates of effect sizes to use in their cost-benefit calculations.

Jackson: Research has fallen short, however, in articulating what kind of bang for the buck community programs can expect and how to measure against some benchmark. For example, what percentage of increase in positive patient outcomes can a program expect to get from adopting CM versus the cost of its treatment as usual? If I'm going to get a 10 percent bump in outcomes, but it's going to cost me 25 percent more, I may not be as interested.

Brigham: Finding useful research can be a